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PROVIDING LOCAL OR OTHER IDENTIFIED NEWS INFORMATION USING AN INTERACTIVE ASSISTANT

ABSTRACT

An interactive assistant, referred to herein as “an interactive assistant,” “a virtual assistant,” or simply “an assistant,” may be configured to identify local or other news information from or more content providers and to output such information to a user. For example, an interactive assistant may accept queries from a user, perform searches, and subsequently identify news information that may be of interest to the user based upon these prior searches. In some cases, the interactive assistant may provide news information to a user in direct response to receiving a request for such information from the user. For instance, the user may ask the interactive assistant to “get local news,” in which case the interactive assistant may identify local news items from one or more content providers that may be of interest, and output such items to the user (e.g., audibly or visually).

DESCRIPTION

An interactive assistant, such as shown in the example of Figure 1 below, may be included in a computing system that is configured to interact with one or more users. The computing system may be, include, or otherwise be included in a mobile device (e.g., smart phone, tablet computer, laptop computer, computerized watch, computerized eyewear, computerized gloves), a personal computer, a smart television, a personal digital assistant, a portable gaming system, a media player, a mobile television platform, an automobile navigation and/or entertainment system, a vehicle (e.g., automobile, aircraft) and/or cockpit display, a home

or other smart appliance and/or related device (e.g., interconnectable appliance/device via Internet of Things), or any other type of wearable, non-wearable, mobile, or non-mobile computing device, and the computing system may or may not include a display device. In some cases, the interactive assistant may be a voice-assistant that receives audible user commands, processes the commands based on speech recognition operations, and performs corresponding actions, such as providing audible responses to user queries and/or performing certain actions. The interactive assistant may provide or utilize a user interface with which a user can communicate to cause the assistant to output useful information, respond to a user's queries, or otherwise perform certain operations to help the user complete a variety of real-world or virtual tasks.

Figure 1 below illustrates an example of an interactive assistant that may be configured to identify local or other news information from or more content providers and to output such information to a user. The interactive assistant may be executed by or otherwise included in the computing system shown in Figure 1. The interactive assistant may accept queries from a user, perform searches, and subsequently identify news information that may be of interest to the user based upon these prior searches. In some cases, the interactive assistant may provide news information to a user in direct response to receiving a request for such information (e.g., "get local news") from the user. The interactive assistant may output such news information to the user either audibly or visually.

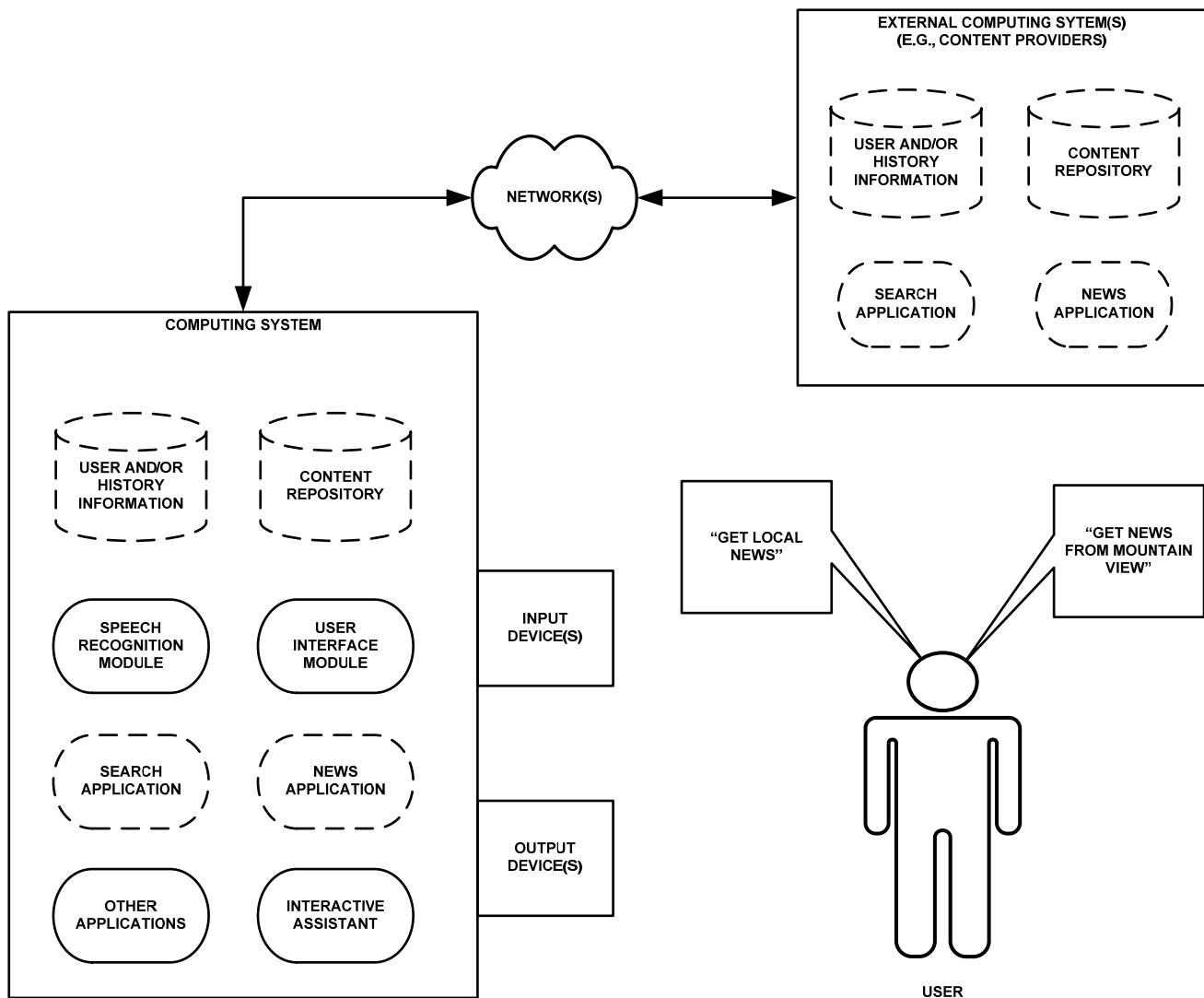


Figure 1

As shown in Figure 1, the computing system that includes the interactive assistant may have or otherwise be communicatively coupled to one or more input devices and one or more output devices. For instance, the input devices may include one or more microphones, a presence-sensitive input device and/or touch-sensitive screen, a mouse, a keyboard, a voice responsive system, a camera, or any other type of device for detecting input from a human or

machine. In some cases, the input device may one or more location sensors (GPS components, Wi-Fi components, cellular components), one or more temperature sensors, one or more movement sensors (e.g., accelerometers, gyroscopes), one or more pressure sensors (e.g., barometer), one or more ambient light sensors, and/or one or more other sensors (e.g., camera, infrared proximity sensor, hygrometer, and the like). Other sensors may include a heart rate sensor, magnetometer, glucose sensor, hygrometer sensor, olfactory sensor, compass sensor, step counter sensor, to name a few other non-limiting examples.

The computing system may also include or be communicatively coupled to one or more output devices, such as one or more speakers or display screens, including a presence-sensitive screen and/or a touchscreen, or any other type of device for generating output to a human or machine. In some cases, the input devices and/or output devices may include one or more other type of wearable, non-wearable, mobile, or non-mobile computing devices that are also used by the user. One or more of the input and/or output devices may be external to and communicatively coupled (e.g., via a wired or wireless connection) with the computing system.

The computing system may also include a user interface module that is configured to manage inputs received by the interactive assistant as users interact with the computing system, and the user interface module may be configured to receive additional instructions from applications, services, platforms, or other modules of the interactive assistant that process user input. The user interface module may also be configured to process output that is provided to users, and may be coupled to the input device(s) and output device(s) of the interactive assistant. The computing system may also include a speech recognition module, which may interface with the user interface module and/or the interactive assistant. When a user provides audible input to

the interactive assistant (e.g., via commands, questions, queries), the interactive assistant may use the speech recognition module to process such audible input.

As described herein, the speech recognition module, user interface module, and interactive assistant are configured to utilize and/or process information received from the input devices only after receiving explicit authorization from the user to do so. The computing system may provide the user (e.g., via the user interface module and/or the interactive assistant) with detailed information about the requested use of data collected by input devices for use by the interactive assistant, in conjunction with the use of specified functions or applications (e.g., one or more of the search application, content delivery applications, or other applications). The speech recognition module, user interface module, and/or interactive assistant only use such data collected by input devices after receiving explicit authorization from user to do so. After receiving such authorization, these modules are configured only to use the data gathered by the input devices for the use or uses authorized by the user.

Further to the descriptions below, a user may be provided with controls allowing the user to make an election as to if and when the interactive assistant, the computing system, and/or the external computing systems described herein can collect or make use of supplemental data (e.g., user information or contextual information about a user's social network, social actions or activities, profession, a user's preferences, or a user's current location), and if and when the user is sent content or communications from a computing system. In addition, certain data may be treated in one or more ways before it is stored or used, so that personally identifiable information is removed. For example, a user's identity may be treated so that no personally identifiable information can be determined for the user, or a user's geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level), so that a

particular location of a user cannot be determined. Thus, the user may have control over what supplemental data is collected about the user, how that supplemental data is used, and what supplemental data is provided to the user.

As shown in Figure 1, the computing system includes a search application. Over time, the user may submit one or more queries to the interactive assistant to request content. Based on such queries, the search application may search for content in one or more content repositories that are local to the computing system and/or stored on one or more external computing systems (e.g., content providers), such as shown in Figure 1. Upon identifying content that is responsive to the user's queries (e.g., content that satisfies one or more criteria specified in the queries), the search application may output the identified content to the user, such as via audible and/or visual output. In addition, the search application may store the history of these searches in one or more datastores containing history information. As shown in Figure 1, the history information may be stored locally on the computing system and/or on the one or more external computing systems.

Based on such history information, a news application may identify news information that may be of interest to the user. For example, if the user has submitted various different queries over time that are each associated with the city of Mountain View, as indicated in the history information, the news application may attempt to identify news items or other information associated with the city of Mountain View, and output such information to the user via the interactive assistant and/or user interface module. The search application and the news application may each be executed locally on the computing system. In some cases, however, one or both of the search application and the news application may be executed on the one or more external computing systems, and may be invoked by the interactive assistant.

In some instances, the user may issue a direct query or request for news information associated with a particular area. For example, as shown in Figure 1, the user may issue an audible request to “get local news.” In this case, the interactive assistant may process this request (e.g., using the speech recognition module and/or user interface module), and invoke the news application to identify and retrieve news information satisfying the user’s request. For this example, the user has requested “local” news information, and the news application may determine the location of the user based upon the current location of the computing system, given the relative proximity of the user with respect to the computing system. In some cases, the computing system may determine its location based on input from one or more sensors (e.g., GPS sensors). In some cases, the computing system may determine its location based upon feedback from the user. For example, the user may, in these cases, provide input data specifying the location of the user. The computing system may also determine its location based upon one or more contextual signals and/or history information associated with user interactions with the interactive assistant.

Upon determining the location of the computing system, the news application may search one or more content repositories stored locally on the computing system and/or the one or more external computing systems to identify news information associated with this particular location. Such news information may include matters associated with local politics, local sports, local restaurants, local recent events, and the like. When the news information is included in the content repositories local to the computing system, the news application and/or the interactive assistant may output the news information directly via the output devices. When the news information is included in content repositories stored on the one or more external computing systems, the external computing systems may stream the news information to the computing

system, and the computing system may then output the received information via the output devices. In such fashion, the computing system is capable of delivering retrieved or received news information even if the computing system is, at a certain point in time, in an offline mode or otherwise disconnected from the external computing systems.

In some cases, prior to outputting the news information to the user, the news application may sort or filter the news information based on one or more criteria. For example, the news application may sort the news information on a time-ordered basis, with the most recent news items being output first. In some cases, the news application may sort or filter the news information based on the content (e.g., sports information, weather information, politics, and the like). In some cases, the news application may further sort or filter the news information based on locations associated with the news items. Thus, if the news information is all generally associated with the city of Mountain View, the news application may further sort the news information based on the particular locations within Mountain View with which specific news items are associated.

Users of the computing system may also provide one or more user preferences with respect to the content provided by the interactive assistant. One or more datastores that are local to the computing system and/or stored on the one or more external computing systems may include these user preferences as user information, as shown in Figure 1. For example, the user information may indicate that the particular user shown in Figure 1 is very interested in football. This user information may be based on explicit feedback received from the user and/or based on prior interactions with the interactive assistant. For instance, if the user has previously initiated various search requests associated with football or a particular football team, the interactive

assistant may determine that the user is interested in football (and perhaps even a particular football team), and may store such user information associated with this particular user.

In general, the computing system and/or the one or more external computing systems may be configured to store user and/or history information associated with prior user interactions with the interactive assistant. As a result, the news application may be configured to sort or filter the retrieved news information based on the stored user and/or history information when outputting the information to the user. Thus, continuing with the example above, if the user and/or history information indicates that the user is very interested in football, the news application may sort or filter the news information to prioritize local news items that are also related to football (or even to a particular football team).

The news application may also sort or filter the news information based on history information associated with other users. For instance, many other users may have recently expressed interest in a recent or noteworthy new event, such as a concert, associated with the city of Mountain View. In this case, although the particular user shown in Figure 1 may not have previously expressed interest in concerts, the news application may nevertheless identify for the user any recent or noteworthy events associated with the city of Mountain View that have gathered interest from other users in general (or even other users of the computing system and/or external computing systems).

As also shown in Figure 1, rather than the user submitting a general request to “get local news,” the user may also issue a more specific request to “get news from Mountain View.” In this case, regardless of the user’s current location, the interactive assistant and/or news application may retrieve and output any recent news associated with the city of Mountain View. For example, at a particular time, the user may be located in another city, such as Los Angeles,

but may still be interested in recent news items associated with Mountain View (e.g., if the user has a residence in Mountain View but may be travelling on business to Los Angeles). In this case, the user may submit a specific request, such as “get news from Mountain View” or “get news from home,” if the user is interested in news-related items for the user’s city of residence. However, the user may also submit a request to “get local news” if the user is interested in news-related items in the user’s current location, such as Los Angeles.

Continuing with the example above, where the user may have a residence in Mountain View, the interactive assistant may determine that Mountain View is the user’s home location based upon prior interactions with the user and the stored user and/or history information. In this case, the news application may sort or filter any obtained news information such that news associated with the user’s home location has the highest priority, regardless of the user’s actual location at any particular time. Thus, if the user is located in Los Angeles (e.g., outside the user’s home location), and the user submits a request to “get local news” (or even just to “get news”), the news application may retrieve news information associated with both Los Angeles and Mountain View, and may prioritize any news-related items that are associated with Mountain View over news-related items that are associated with Los Angeles. In some cases (e.g., based on criteria specified by the user or otherwise indicated in the stored user information), the news application may filter out any received news information that is not associated with the user’s home location, thereby providing the user only with content that is associated the user’s home location.